

dinner." While not looking for *Hormops*, I was overjoyed at meeting it and its capture will long be remembered as one of the most interesting episodes of my collecting days.

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## A REVIEW OF THE SPECIES OF THE COLEOPTEROUS GENUS *SILIS* LATR. WHICH ARE FOUND IN AMERICA NORTH OF MEXICO.

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In this paper are included under *Silis*, not only all of those species which were listed as such by LeConte in his last revision,<sup>1</sup> but also those of *Ditemnus* Lec., for as has been shown by Gorham, Pic., Champion, and other recent workers, the members of the one grade gradually into the other. As stated by Champion,<sup>2</sup> the latest to discuss the genus, *Silis* may be defined as having the "prothorax with the lateral margins incised or constricted at or towards the base, and sometimes (*Ditemnus*) deeply incised at about the middle also, the margins more or less lobed, lamellate, or dentate, the lobes often imbricate, the tarsal claws unclawed, and the seventh ventral segment divided down the middle in ♂." In our fauna, two related genera, *Discodon* Gorh. and *Polemnius* Lec., which have in common with it the divided seventh ventral segment in the male, form with it the group Silini. The genus presents many attractive features such as the peculiar prothoracic armature in the males, the dichromatic and polychromatic races, and the peculiarities of distribution. The armature is often grotesque in structure, is always of a distinctive type in each species and so most useful in classification, and no doubt houses certain of the special sense papillæ. The female as a rule is without any indication of this structure, having a prothorax with simple outlines. She is, therefore, hard to definitely identify unless found in

<sup>1</sup> "Synopsis of the Lampyridæ of the United States," by John L. LeConte, M.D., Trans. Am. Ent. Soc., Vol. IX (1881), pp. 56 and 57.

<sup>2</sup> "Revision of the Mexican and Central American Telephorinæ (Fam. Telephoridae), with descriptions of new species," by George Charles Champion, F.Z.S., Trans. Ent. Soc. London, Vol. 1915, p. 99.

association with her mate. In the eastern and southern parts of the country the species are very constant as to color but on the Pacific coast certain of them are very plastic. Some are truly dichromatic, with the two color phases in the same territory. Others have their different color varieties in different though adjacent territories, true color races, while still others have intermediate as well as the extreme color phases within the same territory and are thus only variable species. This color plasticity is no doubt due to climatic influences for other groups of Coleoptera within the same region share it, such as *Pedilus* (*Corphyra*) and certain of the Elateridæ such as some *Athous*, *Limonius* and *Agriotes*. The lighter colored phases are generally to be found in the warmer lowlands while the darker are more restricted to the cooler coastal areas and the high mountains. Another peculiarity with regard to the distribution of this genus is that many of the more or less isolated mountain ranges of the southwest are apt to have their own distinctive species.

The genus as now constituted is world wide in its distribution. There are, however, certain groups which seem to be more or less definitely restricted to certain localities. With us, the species of the more typical part of the genus, those with the prothoracic armature about or close to the posterior angles, are dominant on the Pacific Slope, but three species being found in the more northern or mountainous part of the Eastern States. Those which belong to the subgenus *Ditemnus* and have the prothoracic armature distinctly in front of the posterior angles, are more southern as a rule in their distribution and quite closely related as a group to those in Mexico and farther south. As to color, the members of this latter group are generally bicolored, but one species in our fauna being entirely black, and quite constant as far as our species are concerned.

The prothoracic armature in general is formed by a portion of the posterior part of the lateral margin of the prothorax being incised and bounded in front by an angular process or an extension outwards of the same in the form of a lobe, and bounded posteriorly by another process which projects outwardly from the side itself or from just beneath. This latter may be in the form of a spine, a lobe, or a broad plate, sometimes so large as to completely fill up the incisure. The inner surfaces of these lobes are usually fringed with fine erect hairs. The construction of this body varies with each

species and is in fact the most conspicuous differential character, so the details of its structure are particularly dwelt upon in the definition of the species.

In this paper, complete descriptions of only the new species will be given. The others will, however, be discussed in some detail which, with the synoptic table and outline drawings of the male prothorax, will, I think, make their identification possible. A large number of specimens has been at my disposal and served as the basis for this paper. Besides my own large series, chiefly from the Pacific Coast, I have examined the specimens in the collections of Dr. F. E. Blaisdell, Mr. H. C. Fall, Mr. Ralph Hopping, Cornell University, and the bulk of those in the United States National Museum, the last received through the courtesy of Dr. E. A. Schwarz and Mr. H. S. Barber. The LeConte types in the Museum of Comparative Zoölogy at Harvard University, I have also been enabled to study through the kindness of Mr. Samuel Henshaw and Mr. Nathan Banks, and have likewise seen accurately determined specimens of Mr. Charles Schaeffer's species received through the generosity of the describer himself. To the above-mentioned institutions and friends, as well as others who have helped me in my work, I therefore now wish to express my thanks.

TABLE FOR THE DETERMINATION OF THE SPECIES OF SILIS LATR.  
BASED MAINLY UPON MALE CHARACTERS.

Lateral prothoracic armature situated at or close to the hind angles. . . . .	1
Lateral prothoracic armature situated distinctly in front of the hind angles ( <i>Ditemnus</i> Lec.) . . . . .	18
1—The posterior appendage of the armature slightly ante-basal and conspicuously spinose . . . . .	2
The posterior appendage of the armature either basal or slightly ante-basal but not sharply spinose . . . . .	5
2—Prothorax narrower than base of elytra and with the process in the form of a broad plate derived from the side of the prothorax and to a great extent filling the incisure, its outer face prolonged into a superior horizontal spine and an inferior prong, the latter close to the hind angle of the prothorax. Length 8 mm. . . . .	3
Prothorax fully as wide at base as base of elytra and with a distinct ante-basal process that is spiniform and that arises close to but below the posterior angles. Length 6-7 mm. . . . .	4
3—Yellow testaceous, head, antennæ, and legs more or less dusky, prothorax orange yellow. Length 8 mm. (Or., high Sierras of Cal., and Utah) . . . . .	<b>S. spinigera</b> Lec.



The ante-basal filamentous process very short and but slightly curved.

Length 4.75 mm. (Panamint Valley, Inyo Co., Cal.).. **S. filicornis** n. sp.

14—Upper surface mostly pale yellow. Length 5-6 mm. (Western Ore. and North. Cal.) .....**S. lutea** Lec.

Upper surface black with pronotal disc yellow. Length 5-6 mm. (Locally along extreme coastal strip from Santa Barbara Cal. to Wash.) .....**S. lutea** var. **filigera** Lec.

15—Prothoracic incisure widely opened externally .....16

Prothoracic incisure almost completely closed by anterior and posterior process .....17

16—The anterior process angulated and directed slightly backwards, the posterior, long, straight, and narrow, directed directly outwards from beneath posterior angles. Length 7 mm. (Argus Mts., Cal.)

**S. desarticola** n. sp.

Both anterior and posterior processes lobed and directed outwards. Black with pronotum orange red. Length 4.5 mm. (Ill., Ind., East. N. Y. to N. Car.) .....**S. spatulata** Lec.

17—Apex of prothorax much narrower than base, sides widely diverging backwards, the anterior process of incisure projecting outwardly beyond normal side line of prothorax and curving backwards until it almost meets the basal process. Length 6-7 mm. (Northern Ariz.)

**S. arizonica** n. sp.

Apex of prothorax but little narrower than base, sides but slightly diverging backwards, the anterior process projecting obliquely backwards without interrupting the normal side line of prothorax and meeting the hook-like extension of the basal process. Length 5.5 mm. (San Jacinto Mts., Cal.) .....**S. fenestrata** n. sp.

18—Posterior margin of prothorax broadly rounded, posterior angles small but evident, both processes broad, the anterior always ear-like, the antennæ quite filiform .....19

Posterior margin of prothorax more or less truncate at middle, antennæ robust and quite serrate .....23

19—Disc of prothorax convex without deep median fossa .....20

Disc of prothorax with deep and broad median fossa .....22

20—Species bicolored, black and orange .....21

Species entirely black, the anterior and posterior processes both long and approaching each other, antennæ as long as the entire body. Length 6.5 mm. (Huachuca and Pinaleno Mts., Ariz.)...**S. nigerrima** Schaeef.

21—The anterior process not reaching the blunt triangular posterior process, the incisure therefore open, the antennæ reaching slightly beyond middle of body. Length 5 mm. (Huachuca and Chiricahua Mts., Ariz.)

**S. abdominalis** Schaeef.

The anterior process overlapping apex of long posterior process, thus making a fenestra of the incisure, the antennæ almost reaching end of body. Length 6 mm. (Tex.) .....**S. perforata** Lec.

22—The anterior process hardly projecting backwards, the posterior long,

- narrow, bifid at apex, and projecting obliquely backwards, the elytra margined with yellow. Length 4.5 mm. (Tex.) .....*S. fossiger* Lec.  
 The anterior process projecting well backwards and overlapping the posterior, the posterior a broad plate that ends outwardly in a blunt tooth and a sharp spine, elytra unicolorous. Length 3.75 mm. (Hot Springs, Ariz.) .....*S. tricornis* n. sp.
- 23—Prothorax entirely orange, apical margin of same reflexed and extended laterally, so as to form well defined lobes, the posterior process broader than the anterior (of armature), the pronotal disc with shallow lunar fossa .....24  
 Prothorax an orange-red margined with black, apical prothoracic margins less reflexed and not expanded laterally into lobes, the posterior process much narrower than anterior, the pronotal disc with shallow circular fossa .....25
- 24—Posterior process but little wider than the anterior, the posterior angles some distance from process, black with dull yellow prothorax. Length 3.5 mm. (Eastern States.) .....*S. bidentata* Say.  
 Posterior process more than twice the width of anterior, the posterior angles overlapping base of posterior process, black with reddish yellow prothorax. Length 4.5–5.5 mm. (Ind., Kan., Mo.)...*S. latiloba* Blatch.
- 25.—(Middle and Southern Cal.) .....*S. obtusa* Lec.

*Silis spinigera* Lec.

*Silis spinigera* Lec., Trans. Amer. Ent. Soc., Vol. V (1874), p. 61;

Trans. Amer. Ent. Soc., Vol. IX (1881), p. 56.

*Silis munita* Lec., Trans. Amer. Ent. Soc., Vol. IX (1881), p. 56.

These two, as surmised by LeConte, are merely color phases of one species. It is truly dichromatic in most parts of its range. It is also our largest species and the only one in which the prothorax of the male is always distinctly narrower than the base of the elytra. The eyes are prominent, together as broad as the interocular area; the antennæ fully three fourths the length of the body; the prothorax one fourth broader than long, with the sides slightly rounded in front and shallowly excavated at the posterior angles, the anterior boundary of the incisure rounded and the process a broad plate bifurcating externally into an anterior sharp horizontal spine and a posterior prong, the hind angles small and blunt, almost concealed by the prong of the process, the base broadly rounded, the disc feebly convex with the longitudinal impression defined posteriorly and a deep fovea just within the incisure as well as an acute tubercle just anterior; the elytra at base one fourth wider than prothorax and seven times as long and slightly scabrous. (Plate IX, fig. 1.)

In the original descriptions, the two spiny projections of the process were given as the anterior and posterior angles of the incisure, hence have misled those dependent upon them for their determination. I have therefore thought it best to redescribe it. Of the first, *spinigera*, I have seen besides the type from Oregon, specimens from the following localities in the Sierras of California, Lake Tahoe, Tuolumne Co., Mariposa Co., Fresno Co., and Tulare Co.; and of the second, *munita*, besides the type from Atlanta, Idaho, specimens from Lake Tahoe and the high Southern Sierras of Tulare Co., Cal., as well as from Utah and from Garland, Col.

**Silis difficilis** Lec.

*Silis difficilis* Lec., Agassiz, L. Superior (1850), p. 230; Trans. Amer. Ent. Soc., Vol. V (1874), p. 60; Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57.

*Silis flavida* Lec., Trans. Amer. Ent. Soc., Vol. V (1874), p. 61; Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57.

After critically examining a large series of the two forms given above, I have finally come to the conclusion that they are only phases of one species. The first, *difficilis*, is black with the disc of the prothorax an orange red, and is to be found not only in the Lake Superior region but farther north into the old Hudson Bay Territory, south through the Rocky Mountains of Colorado and into New Mexico and northern Arizona, west into British Columbia, the Northern Cascades of Washington, and as a stray in the Southern Sierras of California, probably overlapping from Arizona. The Lake Superior and more northern specimens are apt to be slightly smaller, with prothorax less laterally expanded, the antennæ more filiform, and the elytra more scabrous than those of the Rockies and Cascade-Sierra ranges, though they grade into each other. *Flavida* is the light phase, found in the Northern Cascades and the high Sierras. On Mt. Ranier, Washington, I found it in company with the preceding phase, but in the major part of the Sierras it is found alone. In some of the specimens, the prothorax is apparently less broad and with the anterior angles of the incisure more obtuse than in typical specimens. Some specimens are also more densely pilose than others. In the LeConte collection the first specimen of *difficilis*, the one with the label, cannot be the type as it bears a New Mexico locality label. It was described as from the Lake Superior region. Specimen No. 2 is presumably the type. (Plate IX, fig. 3.)

**Silis difficilis** var. **carbo** new variety.

Size, shape, and sculpturing of *difficilis* but entirely black.

Type and paratype in my collection, the type from Bubbs Creek Canon, Kings River, California, altitude 9,700 feet, collected July 9, 1910, paratype Rea Lake, Fresno Co., Cal., altitude 10,500 feet, collected July 20, 1910. Besides these, I have twelve more specimens in my collection, all males, collected at the same general time and in the same region, the high Southern Sierras, and have also seen others in the collections of Mr. Ralph Hopping and of Cornell University, the specimen in the latter collected by Professor J. C. Bradley. This dark variety seems to somewhat replace the variety *flavida* at the higher altitudes of the Sierras.

**Silis atra** Lec.

*Silis atra* Lec., Trans. Amer. Ent. Soc., Vol. XII (1884), p. 22.

This species superficially resembles *S. difficilis* var. *carbo*, but it has a narrower and less explanate prothorax, with sides more parallel and straight, the incisure less deep and the marginal angles less pronounced, the ante-basal process shorter and blunt, not spiniform, the antennæ finer, and the size generally smaller. From *cava*, to which it is compared by LeConte, it differs not only in color, but in having longer antennæ, a more broadly opened incisure, and narrower ante-basal process.

**Silis cava** Lec.

*Silis cava* Lec., Trans. Amer. Ent. Soc., Vol. V (1874), p. 61; Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57

We have in this species the palest member of the genus, it having the legs to a great extent yellow, a feature which the females share with the male. It is also quite constant in character and quite distinct. Its range is throughout most of the lowlands of western Oregon and northern and central California, and it invades the Sierras to a certain extent. Certain specimens from the hot slopes of Mt. Pinos, western Kern Co., Cal., are larger and lighter in color than the general run. (Plate IX, fig. 4.)

**Silis rugosa** new species.

Elongate, slightly shining, black with orange pronotum. Head as broad as apex of prothorax, depressed between the eyes; eyes moderately prominent and widely separated; antennæ three fourths length of body, quite filiform,



the median joints hardly serrate. Prothorax about one fourth broader than long, as broad as base of elytra, apex broadly rounded, sides straight in front and but slightly divergent backwards, moderately excavated posteriorly, the anterior angle of the incisure rounded, the posterior small but acute and decidedly carinated, the ante-basal process short, compressed, rounded at apex and slightly curved forwards, the base lobed, the disc feebly convex. with the longitudinal impression fairly well defined posteriorly, the basal foveæ rather shallow, and the anterior and posterior margins but moderately reflexed. Elytra about four times as long as prothorax, with sides quite straight but slightly diverging backwards, the disc scabrous and finely pilose. Beneath shining in front, abdomen finely transversely wrinkled and subopaque, the seventh ventral segment deeply excavated as usual. Length 4.5 mm., breadth 1.75 mm. (Plate IX, fig. 5.)

The female differs by having the prothorax orange with darker margining, the sides straight and almost parallel to the nonexcavated but obtuse hind angles, and the antennæ but about half the length of the body.

Type male and female in my collection, taken by myself on Mt. Tamalpais, Marin Co., Cal., March 14, 1909. A series of eighteen more specimens from the same locality and one specimen from Fort Bragg, Mendocino Co., Cal., collected December 21, 1914, are also in my collection, and I have seen besides good series from Marin Co., Cal., in the collection of Dr. F. E. Blaisdell.

This species is structurally closest to *cava* but easily separated from that by color as well as the details of the armature. Superficially it resembles *vulnerata* and *S. pallida var. maritima*, but can be distinguished by being smaller and proportionally shorter, by having the pronotum entirely orange except for a black margin, by having smaller and more filiform antennæ, the prothoracic incisure narrower and with the posterior angles of the same more prominent, the basal thoracic foveæ shallower, and the elytra decidedly scabrous, not merely punctate, a character which will assist in separating the females. It seems to be confined to the coastal belt of Middle California.

#### **Silis percomis** Say.

*Cantharis percomis* Say, Bost. Journ. Nat. Hist., Vol. I (1835), p. 159;

Ed. Lec., Vol. II., p. 636.

♀ *Podabrus curtus* Lec., Agass., L. Superior (1850), p. 229.

♂ *Silis longicornis* Lec., Agass., L. Superior (1850), p. 230.

*Silis percomis* Lec., Trans. Amer. Ent. Soc., Vol. V (1874), p. 61; Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57.

This, apparently the most common of the species in northeastern America, varies but slightly. The anterior angles of the prothoracic incisure are somewhat more prominent in certain specimens than in others, where an approach is made towards the condition found in *spatulata*. In the latter, the angles are, however, definitely prolonged into lobes and the posterior processes proceed more definitely from the base. *Percomis* is to be found in the Great Lakes region and the northeastern tier of states. One specimen, from Texas in the National Museum collection, has been seen. In the LeConte collections the specimen bearing the name is not *percomis* but *spatulata*. Specimens two and three, the types of *longicornis* and *curtus*, are correctly placed. (Plate IX, fig. 6.)

*Silis pallida* Mann.

*Silis pallida* Mann., Bull. Mosc., Vol. II (1843), p. 246.

*Silis pallida* Esch., Dej. Cat., 3 Ed., p. 121.

*Silis pallida* Lec., Trans. Amer. Ent. Soc., Vol. V (1874), pp. 60 and 62;  
Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57.

This species is black with the pronotum orange margined with black and with a large median basal black spot as well, and the elytra of a light yellow suffused with black along the margins and at the apex. From other light species it can be readily separated by its shallow incisure and small slightly hooked ante-basal process. It ranges from Sitka, Alaska, the type locality, south through western British Columbia, Washington, and Oregon. In the last two, the typical form is most common in the country between the Cascades and the Coast Range Mountains, the melanotic variety taking its place west of the coastal mountains. Specimens from Sitka as well as good series from other parts of its territory have been seen. (Plate IX, fig. 7.)

*Silis pallida* var. *maritima* new variety.

Elongate, shining, black with yellow mandibles and the sides and front of pronotal disc an orange yellow. Head as broad as apex of prothorax, depressed between the eyes; eyes moderately prominent and widely separated; antennæ fairly stout and almost reaching to apex of elytra. Prothorax broader than long, as broad as base of elytra, apex broadly rounded, sides in front almost straight and slightly diverging posteriorly, the region of the posterior angles shallowly incised, the anterior angle of the same obtuse and the posterior angles small and acute, with a small and short hook-like ante-basal process projecting outwards from just in front of the posterior angle,

the base broadly lobed, all margins reflexed, the disc with deep foveæ at base just within the incisures and with a shallow depression at middle but without a longitudinal impressed line. Elytra about four times length of prothorax, with sides almost parallel and apex quite truncate, the surface distinctly though discretely punctate, and finely, sparsely pilose. Length 5 mm., breadth 1.5 mm.

The female has the antennæ finer and shorter, barely reaching to the middle of the body, the prothorax larger than in the male, as usual distinctly broader at base than base of elytra, much broader at base than apex, with sides gradually arcuate to rounded basal angles, color entirely reddish yellow, the elytra somewhat broader than in male.

Type male and female in my collection, collected by myself at Marshfield, Oregon, June 11 and 12, 1914. Besides these, I have a series of thirty-three specimens in my collection, from the same place, all quite constant. This variety is exactly like *pallida* in every particular except color, differing in that in having the elytra entirely black instead of a pale yellow darker at the margins. Specimens of the typical species are occasionally found with the variety. *S. vulnerata* Lec. is very similar to the above but differs as a rule in having the median prothoracic black spot prolonged to the apex, thus completely dividing the reddish yellow area, in having finer and more filiform antennæ, the prothoracic incisure deeper, with its anterior angle a right angle, the ante-basal process broader and not hooked, the disc with a distinct though fine longitudinal impressed line, and the elytra more coarsely closely punctate and scabrous and with apices more broadly rounded.

#### *Silis vulnerata* Lec.

*Silis vulnerata* Lec., Trans. Amer. Ent. Soc., Vol V (1874), p. 61; Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57.

This species which I at first took to be the same as the preceding, should, however, be readily separated once the very rugose elytra are noticed. It was described from Oregon. I have seen specimens from Pullman and Wawawai, Wash., Coeur d'Alene, Idaho, and from Colorado. It is probably an offshoot of *pallida*, but has diverged sufficiently to be quite distinct and has as its territory the upper part of the Great Basin, or the country east of the Cascades, as *pallida* and its variety, the region to the west.

**Silis filicornis** new species.

Elongate, delicate, slaty black with yellow prothorax. Head as broad as apex of prothorax, depressed between the eyes; eyes prominent; antennæ filiform, slender, extending almost to end of body. Prothorax about one fourth broader than long, apex broadly rounded, sides in front almost straight and slightly divergent backwards, the incisure but a small rectangular notch at the posterior angles, with a depressed lamina from the lateral margin forming its anterior boundary and a small thread-like process slightly curving forwards, its posterior boundary, this process only partially enclosing the incisure, the posterior angles blunt and not projecting, the disc with a slight longitudinal depression at middle, a transverse sulcus near posterior margin ending each side in a small foveæ, and with prominent tubercles overhanging the armature and the posterior margin lobed. Elytra about five times as long as prothorax, slightly broader behind, narrowly margined, and with disc rather coarsely, closely, and rugosely punctured, and finely, sparsely pilose. Beneath uniformly dull and finely rugose, the seventh ventral normally divided. Length 4.75 mm., breadth 1.75 mm.

Type, a unique male in the collection of the U. S. National Museum, secured in the Panamint Valley, Inyo Co., Cal., April, 1891, by Albert Koebele, marked Type, Cat. no. 21694, Panamint Valley (Koebele).

This species best belongs near *S. lutea* var. *filigera* Lec., but it is narrower and more delicate in every way, with the posterior margin of the prothorax lobed, not broadly rounded, the posterior angles almost rectangular and not conspicuous, the incisure a mere notch at the posterior angles, and the posterior process a very minute thread which only partially encloses the incisure. It is a most interesting product of the desert.

**Silis lutea** Lec.

*Silis lutea* Lec., Journ. Acad. Nat. Sc. Phila., 2d Ed., Vol. V (—), p. 333; Trans. Amer. Ent. Soc., Vol. V (1874), pp. 61 and 62; Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57.

*Silis pallens* Lec., Proc. Acad. Nat. Sc. Phila., Vol. V (1851), p. 339.

var. *filigera* Lec., Trans. Amer. Ent. Soc., Vol. V (1874), p. 62; Trans. Amer. Ent. Soc., Vol. IV (1881), p. 57.

These two are simply color phases of one species as is the case with *pallida* and *maritima* and superficially they closely resemble them. Besides the entirely different type of prothoracic armature, *lutea* has in addition as a differentiating character from *pallida*, the elytra simply blackened apically, not margined with black as well. *Filigera* can best be separated from *maritima* aside from the arma-

ture, by its having the red area of the pronotum completely bisected. In the female, the spot is almost bisected. The more rugose elytra of *vulnerata* will generally enable that to be separated as will also the rugose elytra of *rugosa* that species. *Lutca* is found more or less widely distributed throughout western Oregon and the more western parts of northern and central California, while *filigera* is confined to a narrow coastal strip of land. Specimens have been taken at Santa Barbara, Cal., the type locality, Carmel Bay, Cal., Fieldbrook, Humboldt Co., Cal., and Tenino, Wash. Of the three coastal black forms, this therefore has the greatest distribution for *rugosa* only ranges from Marin to Mendocino Co., Cal., and *maritima* along the coast of Oregon. (Plate IX, fig. 8.)

#### *Silis spatulata* Lec.

*Silis spatulata* Lec., Trans. Amer. Ent. Soc., Vol. IX (1881), p. 57.

This eastern black species resembles *percomis*, as I have stated before, but it appears to be much scarcer. It has been recorded from Illinois, the type locality, and Indiana (Blatchley), and I have seen specimens from Ithaca, N. Y., Plummers Is., Md., and Tryon, N. C. (Plate IX, fig. 9.)

#### *Silis deserticola* new species.

Elongate, large, rather dull, slaty black with entire thorax orange. Head as broad as apex of prothorax, depressed between the eyes; eyes prominent, antennæ filiform and reaching three fourths length of body. Prothorax almost a semicircle in outline, one fourth broader at base than long, apex broadly rounded, sides in front almost straight and widely divergent backwards, the posterior incisure deep and broadly opening almost directly outwards, the anterior angle of the same acute, prominent, divergent, and with its posterior margin reflexed and cariniform, the posterior angles small and acute, the posterior process a blunt spine of moderate length projecting directly outwards from beneath the posterior angles, the base broadly lobed and including processes, of same breadth as base of elytra, the disc with deep foveæ just within the incisures and with distinct longitudinal sulcus at middle. Elytra about six times as long as prothorax, slightly wider posteriorly, moderately coarsely, closely punctured, somewhat scabrous, and with an evident though short white pubescence. Beneath shining in front and dull and rugose over abdomen. Length 7 mm., breadth 3 mm.

Type and paratype in the collection of the United State Museum, collected in the Argus Mountains, a desert range of southeastern California, May, 1891, by Albert Koebele and marked Type and Paratype, Cat. no. 21694, Argus Mts., Cal. (Koebele).

This species is one of the largest in our fauna, only exceeded in size by *spinigera* and equaled by *arizonica*. Like the latter, it has a prothorax which is very much broader at base than at apex, but has an armature of a different type. The prothoracic incisure is more nearly that of *difficilis* but the anterior angles of the incisure are strongly reflexed along their posterior margins, whereas that character is lacking in the latter, and the posterior process is broader and blunter. The general shape of *deserticola* is also different, very broad behind, and the basal foveæ are several times larger and the disc deeply sulcate as against one that is unimpressed.

**Silis arizonica** new species.

Elongate, large, moderately shining, black with an entirely orange prothorax. Head as broad as apex of prothorax, depressed between the eyes; eyes prominent; antennæ filiform and reaching fully three fourths length of body. Prothorax over one fourth broader at base than long and broader than base of elytra, apex broadly rounded, sides in front almost straight and widely diverging backwards, the posterior incisure a small fenestra bounded in front by a hook-like process, the extension of the anterior angles, and posteriorly by a broad and rounded process which extends directly outwards from beneath the moderately developed acute hind angles, this process having at its middle a crest that extends forward and almost meets the anterior process so as to partially close the incisure, the entire armature protruding outwardly from the posterior angles, well beyond the line of the lateral margin, the posterior margin narrowly lobed, and the disc with small deep foveæ just within the lateral armature but otherwise without any sculpturing of note. Elytra about 5.5 times as long as prothorax, wider posteriorly, coarsely, closely punctate, and scabrous, with short, fine, and sparse ashen pubescence. Beneath slightly shining in front and dull and rugose over abdomen. Length 7 mm., breadth 2.75 mm. (Plate IX, fig. 11.)

Type in my own collection, captured at Prescott, Ariz., August, 1910, by Mr. J. August Kusche. In the National Museum series of specimens are nine males and three females of the same species, all collected in May and June, at Williams, Ariz., by Barber and Schwarz. They are all somewhat smaller than the type, averaging but 6 mm. in length. The females are slightly broader than their mates, with finer and shorter antennæ, and with the prothorax quite transverse, almost twice as wide as long, the apex broadly rounded, sinuate just before the anterior angles, the angles themselves obliquely truncate, sides straight except just in front of posterior angles where slightly sinuate, the posterior angles nearly rectangular, and the posterior margin broadly lobed.

This species is somewhat suggestive of *deserticola*, particularly as regards the greater breadth of the prothorax posteriorly, but its armature is much like that seen in *fenestrata*. It is a species of the highlands of northern Arizona, a region where *S. difficilis* Lec. is also to be found.

**Silis fenestrata** new species.

Elongate, but slightly shining, black with disc of prothorax orange. Head as broad as apex of prothorax, depressed between the eyes; eyes moderately prominent and well separated; antennæ reaching over three fourths the length of body, quite filiform, the median joints not serrate; prothorax about one fourth broader than long, as broad as base of elytra, apex broadly rounded, sides in front almost straight, divergent posteriorly, the posterior incisure small and almost entirely closed, the acute anterior angle bounding it extending obliquely backwards, overlapping, and partially locking with the hook-like process of the posterior appendage, this latter projecting outwardly from the base itself, the outer part of the armature not extending beyond the normal lateral margin, the base lobed, the disc feebly convex with a poorly defined longitudinal impression and rather deep basal foveæ, and the anterior and posterior margins moderately reflexed. Elytra four and a half times as long as prothorax, widest one third distant from apex, the disc rather coarsely and closely punctured, somewhat rugose and dull, and rather finely, sparsely clothed with cinereous pile as usual. Beneath shining in front and dull rugose over abdomen. Length 5.5 mm., breadth 2 mm. (Plate IX, fig. 10.)

Type, a unique male in my collection, given to me by Mr. J. C. Bridwell, who captured it on Mt. San Jacinto, southern California, July, 1912.

It is a species which has its closest relative in *arizonica* but its non-protuberant armature will readily separate it from that.

**Silis nigerrima** Schaefer.

*Silis nigerrima* Schaefer., Journ. N. Y. Ent. Soc., Vol. XVI (1908), p. 66.

This species forms, with the three following, a group which while having the general facies, type of antennæ, and so forth, characteristic of the species which precede, yet shares with the succeeding three and more typical members of the subgenus *Ditemnus* their most important features, and thus serves as a connecting link between the two groups. It is entirely black and the most distinctly characterized of the three all black forms found within our territory. So far, it has only been found in the mountains of southern Arizona, such as the Huachuca and at Camp Grant in the Pinaleno Mountains. (Plate IX, fig. 12.)

**Silis abdominalis** Schaeff.

*Silis abdominalis* Schaeff., Journ. N. Y. Ent. Soc., Vol. XVI (1908), p. 66.

The color, the less protuberant armature, smaller posterior lobe, and shorter antennæ, will readily separate this species from the preceding. It was described as from the Huachuca Mountains, but has also been taken in the Chiricahua Mountains, also in southern Arizona. (Plate IX, fig. 13.)

**Silis perforata** Lec.

*Silis perforata* Lec., Trans. Am. Ent. Soc., Vol. IX (1881), p. 57.

This species is very closely related to *abdominalis*, but is generally more elongate, grayer, more coarsely pilose, with only the front of head, prothorax, and abdomen yellow, whereas the other has the base of the antennæ and basal portion of legs also similarly colored, the prothorax proportionally broader, the anterior lobe of the armature longer and more distinctly truncate apically, the posterior lobe more posterior, longer, broader, and more lamellate, extending outwardly well beneath the apex of the anterior so that a definite fenestra appears when the view is from above, the basal foveæ distinct though small in contrast to the other where they merge with the basal sulcus. The female has the prothorax transverse, completely and broadly margined, with the apical margin broadly arcuate, the basal more distinctly arcuate, the sides slightly sinuate, and the hind angles small and obtuse. The antennæ are also shorter than in the male, as usual, extending barely to the middle of the body in contrast to the male where they extend fully three fourths the length of the body. The species seems to be limited to Texas, specimens before me being from San Antonio, Corpus Cristi, and San Diego.

**Silis fossiger** Lec.

*Ditemnus fossiger* Lec., Trans. Am. Ent. Soc., Vol. IX (1881), p. 58.

This very pretty species, the only definitely vittate one in our fauna, has in common with the following, the deep median pit in the male pronotum and similar type of armature but it differs in detail by having the anterior lobe not produced backwards, by the posterior process being distinctly separated from it and by extending backwards as a narrow parallel-sided process with a deep emargination at apex. The process also is distinctly separated from the posterior



angles as in *nigerrima*. The males have the elytra laterally margined with yellow. The prothorax of the female is almost squarely truncate in front, broadly rounded posteriorly, and with sides almost straight but divergent to the obliquely truncated hind angles, the elytra distinctly rugose whereas they are not so in the males, and with both lateral and sutural margins yellow. It is found in Texas, specimens from Dimmit Co. and Brownsville having been seen. The Mexican, *S. dilacerata* Gorb. is its closest relative and is in fact but a mere variety of this as comparison with an authoritatively determined specimen has shown. The latter has only the black median longitudinal pronotal stripe to separate it. In the LeConte collection the specimen bearing the label is undoubtedly not the type. In fact it is not *fossiger* at all but the following, *tricornis*. The type from Texas is probably in the Horn collection. LeConte retained an Arizona specimen for his collection but did not carefully compare it with the Texas type.<sup>1</sup>

**Silis tricornis** new species.

Small, short, but slightly shining, black with prothorax orange, slightly maculated in front and behind with black. Head as broad as apex of prothorax and depressed between the eyes. Prothorax about one third broader than long, apex straight and not reflexed, sides diverging from apex for anterior third, then merging with the lateral armature which consists of a broad horn-like process extending backwards from in front of the middle and a broad plate extending outwardly from behind it terminating in an anterior tooth and a posterior spine, the opening between the two processes narrow, the basal angles small, very acute, and somewhat posterior to the armature, the base truncately lobed, the disc with a broad, deep fossa at middle, and transverse sulcus close to basal margin. Elytra slightly more than four times length of prothorax, somewhat wider posteriorly, broadly rounded apically, distinctly margined, the disc scabrous and with a sparse yellowish pile. Beneath opaque and finely rugose. Length 3.75 mm., breadth 1.5 mm.

Type, a unique in the National Museum collection, taken at Hot Springs, forty-five miles north-northwest of Phoenix, Ariz., June 22, by Barber and Schwarz, and marked Type, Cat. no. 21696, Hot Springs, Ariz. (Schwarz and Barber). The specimen is somewhat mutilated, the antennæ having been lost. A second specimen is in the LeConte collection, labeled as *fossiger*.

<sup>1</sup> Upon examining the Horn Collection, I find that my surmise is correct. The Texas specimen upon which the description is based is there. It is therefore the true type. With it are five other specimens, all from Arizona, and all like the LeConte specimen.

The peculiar armature of this insect makes it very distinct but the deeply pitted pronotum shows its relationship to the preceding. In the characteristics of the posterior lobe it shows an approach to the Mexican *S. biauriculata* Champ., but it has a much simpler type of anterior lobe than has the species from farther south. The unicolorous elytra also separates it. (Plate IX, fig. 2.)

**Silis bidentata** Say.

*Cantharis? bidentata* Say., Journ. Acad. Nat. Sci. Phila., Vol. V, p. 169;  
Ed. Lec., Vol. II, p. 278.

*Silis lepida* Dej., Cat., 3d Ed., p. 121.

*Silis bidentata* Say, Proc. Acad. Nat. Sc. Phila., Vol. V (1851), p. 339.

*Ditemmus bidentatus* Lec., Class. Col. N. Am., Smith. Mis. Coll., Vol. III  
(1861-62), p. 189; Trans. Amer. Ent. Soc., Vol. IX (1881), p. 58.

This common Eastern species seems to be distributed throughout the Middle and South Atlantic States and along the western flanks of the Alleghany Mountains, but from Indiana west to the Rockies it appears to be replaced to a great extent by the following. It is also fairly constant though the color of the head is apt to be red in the northern specimens and piceous in the southern specimens. (Plate IX, fig. 14.)

**Silis latiloba** Blatch.

*Ditemmus latilobus* Blatch Col., Indiana, p. 837.

This differs from the preceding mainly in being larger, in having the head uniformly piceous, the posterior lobe of the lateral thoracic armature more than twice the width of the lobe in front and with its outer margin obliquely truncate, and the lateral extension of the apical margin less lobe-like. It was described from Indiana but specimens have also been seen from Minnesota, Iowa, Nebraska, and Missouri. It seems to be rather common in Missouri.

**Silis obtusa** Lec.

*Ditemmus obtusus* Lec., Trans. Am. Ent. Soc., Vol. V (1874), p. 62.

The prothorax broadly bordered with black, the entire absence of lateral lobing to the anterior margin, the broader anterior lobe of the armature and its projection backwards, the smaller and more hook-like posterior lobe, and the deep and rounded median fossa, distinctly separates this species from either of the preceding two. It is found in both middle and southern California, but is more common in the latter region. (Plate IX, fig. 15.)

